Training - Day-to-Day Energy Optimization for Industrial Plants

MENERG-EN-P | Face-to-face only | 4 days

This course aims to optimize energy consumption and operational costs by improving operation of thermal equipment and steam network balance

Level

Skilled

Public

Operation, technical staff & supervisors involved in the technology and operation of thermal equipment, and interested in energy consumption optimization of the plant

Objectives

Attendees will be able to implement the following skills:

- Identify opportunities to improve energy balances on an industrial site
- Define operating conditions and means of adjustment to optimize combustion in furnaces and boilers
- Identify key points in the production and economic use of steam and electricity in factories

Pedagogical & technical resources

- Practical course and case studies based on industrial feedbacks
- Numerous exercises to improve understandings

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

ENERGY BALANCE - EFFICIENCY & CONTEXT — 0.25 day

KPI's definition (Key Performance Indicators): energy intensity and efficiency, units and use.
Motivations and constraints: energy dependence and regulation.
Different approaches for energy efficiency: operation improvement, operating conditions optimization, significant improvement solutions, Best Available Techniques (BAT).

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ENERGY CONSUMPTION INSIDE FURNACES & BOILERS — 0.75 day

Main type of furnaces and boilers. Operating conditions.
Heat balance, efficiency estimate. Scope and limitations to improve efficiency.
Material and equipment used to improve efficiency and heat recovery.
Applications and exercises:

- Heater efficiency estimate and flue gas composition calculation.
- Boiler operating conditions analysis - Heat recovery in radiant and convection zone.
- Impact of fuel composition on atmospheric emissions.

ELECTRICITY & STEAM PRODUCTION — 1.25 days

Cogeneration cycles: boiler-steam turbine, gas turbine-waste heat boiler.
Operating conditions (extraction or discharge pressure, single recovery or post-combustion waste heat boiler's operation) and thermal performance.
Steam network operation and balance. Mechanical energy produced by steam expansion, energy recovery and electricity production optimization.
Sources of margin: technology and use of steam traps.
Application:

- Study of a power plant.
- Estimation of production cost for steam (HP, MP, LP) and electricity.

HEAT & MECHANICAL ENERGY RECOVERY — 1.25 days

Scope and limitations of heat recovery inside heat exchangers. Parameters impacting heat flux and heat transfer.
Sources of margin: heat exchangers performance follow-up, impact of fouling, cleaning strategy and optimum cleaning frequency calculation.
Low temperature heat recovery: heat pumps solutions or mechanical compression of gases (main operating constraints).
Mechanical energy recovery inside process-gas turbines.
Application:

- Heat exchanger train performance follow-up.
- Optimum cleaning frequency calculation.

PROCESS OPERATION — 0.5 day

Limitation of losses: mechanical (operating conditions) and thermal (insulation).
Ways to reduce energy consumption by adjusting operating conditions (pressure, recycle gas flowrate...), thermal integration.
Applications:

- Study of different flow control system on compressor.
- Impact of a distillation column operating parameters on energy consumption.
- Impact of a lack of thermal insulation.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com

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